

WHAT IS CLAIMED IS:

- 1 1. A magnetic adsorption device comprising:
2 a magnetic circuit block having a cavity extending in one direction and divided
3 into a plurality of magnetic pole members at intervals in the circumferential direction
4 of said cavity by a plurality of spacers; and
5 a permanent magnet assembly having an N pole and an S pole and capable
6 of selectively rotating at a first and a second positions spaced apart about an axis of
7 said cavity so as to adsorb and release a magnetic substance;
8 wherein said spacers adjoining about said axis are at angular intervals smaller
9 than 180° about said axis.
- 1 2. A magnetic adsorption device according to claim 1, wherein said
2 spacers adjoining about said axis are at angular intervals from 50° to 150°.
- 1 3. A magnetic adsorption device according to claim 1, wherein said
2 spacers adjoining about said axis are at angular intervals from 60° to 120°.
- 1 4. A magnetic adsorption device according to claim 1, wherein said
2 permanent magnet assembly includes a bar-like magnetic member disposed in said
3 cavity and a pair of permanent magnets disposed around said magnetic member,
4 wherein one and the other of the permanent magnets directs one and the other of
5 the N pole and the S pole toward said magnetic member and directs the other and
6 the one of the N pole and the S pole toward the inner face of the cavity.
- 1 5. A magnetic adsorption device according to claim 4, wherein said
2 permanent magnet includes a plate-like magnet with high coercive force magnetized
3 in its thickness direction.
- 1 6. A magnetic adsorption device according to claim 5, wherein said cavity
2 and said magnetic member have a circular sectional shape and said permanent
3 magnet is curved like an arc.
- 1 7. A magnetic adsorption device according to claim 1, further comprising:

2 an end plate attached to one end portion of said magnetic circuit block in said
3 axial direction and having a through hole for receiving a part of said permanent
4 magnet assembly in said axial direction; and

5 a rotating member connected with one end portion of said permanent magnet
6 assembly in the direction said axis so as to angularly rotate said permanent magnet
7 assembly about said axis.

1 8. A magnetic adsorption device according to claim 7, wherein said
2 rotating member includes a handle connected with one end portion of said
3 permanent magnet assembly so as to angularly rotate about an imaginary axis
4 extending in a direction crossing the axis of said cavity, and

5 wherein said end plate has a first and a second recesses for receiving said
6 handle so as to selectively maintain said permanent magnet assembly at a first and
7 a second position releasably.

1 9. A magnetic adsorption device according to claim 8, further comprising
2 a pusher disposed in said permanent magnet assembly so as to apply force to said
3 handle in a direction that said handle is received in said first and second recesses.

1 10. A magnetic adsorption device according to claim 9, wherein said end
2 plate further has an inclined plane between said first and second recesses, said
3 inclined plane going away from the side of said magnetic circuit block, the nearer
4 either one side of said first and second recesses.

1 11. A magnetic adsorption device according to claim 1, wherein said
2 magnetic circuit block may have at least one magnetic adsorption portions.

1 12. A magnetic apparatus comprising: a plurality of magnetic adsorption
2 devices described to any one of claims 1 through 11; and a connecting member for
3 connecting said plurality of magnetic adsorption devices.

1 13. A magnetic apparatus according to claim 12, wherein said connecting
2 member includes a hole capable of engaging a suspension member.

1 14. A magnetic apparatus according to claim 12, further comprising an
2 engaging member connected with said connecting member or said magnetic

3 adsorption devices, wherein said engaging member has a hole capable of engaging
4 a suspension member.

1 15. A magnetic apparatus according to claim 12, wherein each said
2 magnetic adsorption device has at least one magnetic adsorption portion, and
3 wherein adjoining magnetic adsorption devices are connected so that said magnetic
4 adsorption portion may be located on the same side.

1 16. A magnetic apparatus according to claim 12, wherein each said
2 magnetic adsorption device has at least one magnetic adsorption portion, and
3 wherein adjoining magnetic adsorption devices are connected such that said
4 magnetic adsorption portions are located at angular intervals around an imaginary
5 circle.

1 17. A production method of a magnetic adsorption device, comprising
2 steps of:

3 forming grooves open on the outer surface of a magnetic cylindrical member
4 made of a magnetic material and extending in the longitudinal direction of said
5 cylindrical member at a plurality of positions of said magnetic cylindrical member,
6 said grooves being at intervals in the circumferential direction of an imaginary circle;

7 disposing in each said groove a strip-shaped non-magnetic member
8 extending in the longitudinal direction of said cylindrical member;

9 connecting said non-magnetic member to said cylindrical member; and
10 machining the inner face of said cylindrical member.

1 18. A production method according to claim 17, wherein the step of
2 machining the inner face of said cylindrical member includes removing the inner
3 portion of said cylindrical member at least to such an extent as leakage of the
4 magnetic flux between the regions divided by said grooves is ignorable.

1 19. A magnetic adsorption device according to claim 17, wherein the width
2 of said non-magnetic member is smaller than the depth of said groove, and wherein
3 the step of connecting said non-magnetic member to said cylindrical member
4 includes filling a non-magnetic welding material in a remaining space within said
5 groove excluding the space for disposing said non-magnetic member.